

REMARKS

The Examiner's Action mailed on April 28, 2003, has been received and its contents carefully considered. Additionally attached to this Amendment is a Petition for a Two-month Extension of Time, extending the period for response to September 28, 2003.

In this Amendment, Applicants have editorially amended the specification and amended claims 1, 2 and 12. Claims 7, 8 and 13 have been canceled. Claim 1 is the independent claim. Claims 1-6 and 9-12 remain pending in the application. For at least the following reasons, it is submitted that this application is in condition for allowance.

The Examiner has rejected claims 1-11 as being anticipated by *Hancock* (USP 5,377,555). Because claims 7 and 8 have been canceled, Applicants will treat this rejection as pertaining only to pending claims 1-6 and 9-11. It is submitted that these claims are patentably distinguishable over the cited reference for at least the following reasons.

Applicants' independent claim 1 is directed to a tilt steering apparatus which includes, *inter alia*, a cam surface and a cam follower which are relatively rotated to cause an edge of the cam follower to be brought into sliding, and non-rotating contact with the cam surface as a lock lever is rotated. The cam surface includes a locking position, a releasing position and an intermediate position disposed between the locking and releasing positions. The intermediate position includes a plurality of slopes which include at least two linear and adjacent slopes corresponding to a rotation slope position of the lock lever. The at least two linear slopes slope upwards in a same direction and are connected together at a protruding portion that projects toward the cam follower.

Further, the cam surface presses the edge of the cam follower as the lock lever is rotated in the locking direction causing the side plates of a fixed bracket and the side plates of a tilt bracket to be pressed against each other, resulting in the steering column being locked at the adjusted tilt position.

Applicants' claimed invention causes the side plates of both brackets to be pressed against each other at the beginning position of a stroke of the lock lever. As a result, the lock apparatus is unlikely to rattle, and noise which is attributed to the rattle can be prevented. Moreover, this claimed configuration improves a feeling of the operation of the lock lever. Moreover, Applicants' claimed invention results in a tilt steering apparatus in which the operation force needed when moving the lock lever to a locking position can be reduced without requiring any increase in the operating angle of the lock lever, due to the plurality of slopes being provided in the intermediate position. This configuration is especially advantageous when using a cam and a cam follower which are in direct sliding contact, due to the increase in frictional resistance that occurs therebetween. This claimed configuration is not disclosed or suggested by the cited reference.

Hancock discloses a steering column clamping mechanism in which a roller 11 is brought into rolling engagement with a surface of a cam 10. This reference discloses that the cam 10 includes an unclamped position 10B, which is referred to in claim 1 of this patent as a first zone. This reference further discloses a clamped position which extends from point 10D to point 10C. Point 10D is referred to in the claim 1 as a third zone and point 10C is referred to in the claim 1 as a second zone. As is illustrated, the position 10C is lower than the position 10D, to retain the roller 11 in the clamped

position after it passes the point 10D. This patent discloses that this configuration is necessary due to the use of the roller, which would otherwise roll down the slope 10A. This reference also discloses that the cam surface is constituted by the slope 10A. Thus, and in summary, when the roller 11 is in the position 10B, the clamping mechanism is in an unclamped condition. When the roller 11 is in the position 10D or 10C, the clamping mechanism is in a clamped condition. The slope 10A is the transition between the unclamped position and the clamped position.

However, and in contrast to the present invention, this reference does not disclose or otherwise suggest that an edge of a cam follower is brought into sliding, and non-rotating contact with a cam surface as the lock lever is rotated, as recited by claim 1. Instead, the roller 11 is specifically disclosed as being brought into rolling engagement with the surface of the cam. Furthermore, because the follower is constituted as a roller, this follower has no edge which is in contact with the cam surface, as required by Applicants' independent claim 1.

Furthermore, and as acknowledged by the Examiner's Action, *Hancock* does not disclose or otherwise suggest an intermediate position disposed between a locking position and a releasing position which includes at least two linear and adjacent slopes, as recited by claim 1. It is noted that the cam surface 10A, by the Examiner's own admission, is curved, rather than being linear, as required by claim 1.

Moreover, Applicants' claim 1 requires that the two linear slopes slope upward in the same direction and are connected together at a protruding portion that projects toward the cam follower. In contrast, the cited reference does not disclose such a protruding portion. Although the reference does disclose a higher spot 10D, it is noted

that this higher spot 10D is not disposed between two slopes which are linear and which slope upward in the same direction, as required by claim 1. As such, it is submitted that Applicants' independent claim 1, and the claims dependent therefrom, are *prima facie* patentably distinguishable over the cited reference. It is requested that this rejection, as it pertains to the rejected claims, be withdrawn, and it is requested that these claims be allowed.

The Examiner has also rejected claims 12 and 13 as being obvious over *Hancock* in view of *Fevre et al.* (USP 5,743,150). Because claim 13 has been canceled, Applicants will treat this rejection as pertaining to claim 12. It is submitted that this claim is patentably distinguishable over the cited references for at least the following reasons.

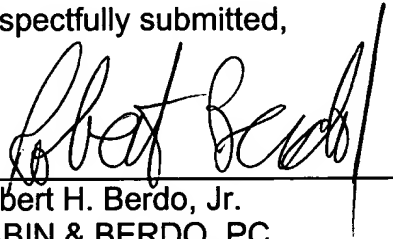
Applicants' claim 12 depends from independent claim 1. As noted-above, the primary reference of *Hancock* does not disclose or suggest a cam surface having an intermediate position disposed between a locking position and a releasing position, with the intermediate position including a plurality of slopes which includes at least two linear and adjacent slopes which slope upwards in a same direction and which are connected together at a protruding portion that projects toward the cam follower. Similarly, *Fevre et al.* do not overcome this deficiency. Although from the drawings it appears that the cam surface of the cam 53 of *Fevre et al.* may be linear, it is also noted that there appears to be only one slope, rather than two slopes as required by Applicants' independent claim 1. Moreover, this reference does not appear to disclose or suggest a protruding portion that projects toward the cam follower which connects together the two linear slopes as required by Applicants' independent claim 1. As such, it is submitted

that Applicants' independent claim 1, and dependent claim 12, are *prima facie* patentably distinguishable over the cited combination of references. It is requested that this rejection be withdrawn and that this claim be allowed.

It is submitted that this application is in condition for allowance. Such action and the passing of this case to issue are requested.

Should the Examiner feel that a conference would help to expedite the prosecution of the application, the Examiner is hereby invited to contact the undersigned counsel to arrange for such an interview.

Respectfully submitted,



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Date

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